



Conference Abstract

# Antibacterial activity of thin films $\text{TiO}_2$ doped with Ag and Cu on Gracilicutes and Firmicutes bacteria

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## Abstract

This research aims to study the antibacterial activity of thin films nanostructured  $\text{TiO}_2$  doped with Ag and Cu on Gracilicutes and Firmicutes bacteria with clinical significance. The thin films were deposited on glass substrates without heating during the deposition by radio frequency magnetron co-sputtering of  $\text{TiO}_2$  target and pieces of Ag and Cu. The total surface area of Ag was  $60 \text{ mm}^2$  and this one of Cu was  $100 \text{ mm}^2$ . The r.f. power was 50W and sputtering atmosphere was Ar (0,8 Pa). The thickness of the films was about 60 nm. The experiment was conducted under day light regime. The test strains *Bacillus cereus*, *Staphylococcus epidermidis*, *Salmonella enterica*, *Escherichia coli* and *Pseudomonas* sp. were used. The bactericidal effect was established at different time point between 30 min - 90 min for *Pseudomonas* sp. and *S. enterica*. The Firmicutes bacteria *B. cereus* and *S. epidermidis* were killed at 4<sup>th</sup> and 8<sup>th</sup> h of the treatment respectively. The effect against *E. coli* was bacteriostatic till 10<sup>th</sup> hour. The toxic effect was evaluated by classical Koch's method and optical density measurements. The results were confirmed by assessment of dehydrogenase activity inhibition. The film could be used in medical and clinical practice.

## Keywords

nanomedicine, bactericidal effect, Gram positive and Gram negative bacteria, clinical significant strains

## Presenting author

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## Author contributions

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## Conflicts of interest

The authors declare that there is no conflict of interests.